

SEQUENCE LISTING

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<120> HIV-PEPTIDE-CARRIER-CONJUGATES

<130> PA059WO

<150> US 60/457,348

<151> 2003-03-26

<160> 128

<170> PatentIn version 3.2

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<212> DNA

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 <211> 132  
 <212> PRT  
 <213> Bacteriophage Q-beta

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Ala Lys Leu Glu Thr Val Thr Leu Gly Asn Ile Gly Lys Asp Gly Lys  
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Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly Val  
 20 25 30

Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val  
 35 40 45

Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys Val  
 50 55 60

Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser Cys  
 65 70 75 80

Asp Pro Ser Val Thr Arg Gln Ala Tyr Ala Asp Val Thr Phe Ser Phe  
 85 90 95

Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu Leu  
 100 105 110

Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln Leu  
 115 120 125

Asn Pro Ala Tyr  
 130

<210> 11  
 <211> 328  
 <212> PRT  
 <213> Bacteriophage Q-beta

<400> 11

Met Ala Lys Leu Glu Thr Val Thr Leu Gly Asn Ile Gly Lys Asp Gly  
 1 5 10 15

Lys Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly  
                   20                  25                  30

Val Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg  
           35                  40                  45

Val Thr Val Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys  
       50                  55                  60

Val Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser  
   65                  70                  75                  80

Cys Asp Pro Ser Val Thr Arg Gln Ala Tyr Ala Asp Val Thr Phe Ser  
           85                  90                  95

Phe Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu  
          100                 105                 110

Leu Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln  
      115                 120                 125

Leu Asn Pro Ala Tyr Trp Leu Leu Ile Ala Gly Gly Gly Ser Gly Ser  
      130                 135                 140

Lys Pro Asp Pro Val Ile Pro Asp Pro Pro Ile Asp Pro Pro Pro Gly  
   145                 150                 155                 160

Thr Gly Lys Tyr Thr Cys Pro Phe Ala Ile Trp Ser Leu Glu Glu Val  
          165                 170                 175

Tyr Glu Pro Pro Thr Lys Asn Arg Pro Trp Pro Ile Tyr Asn Ala Val  
          180                 185                 190

Glu Leu Gln Pro Arg Glu Phe Asp Val Ala Leu Lys Asp Leu Leu Gly  
      195                 200                 205

Asn Thr Lys Trp Arg Asp Trp Asp Ser Arg Leu Ser Tyr Thr Thr Phe  
      210                 215                 220

Arg Gly Cys Arg Gly Asn Gly Tyr Ile Asp Leu Asp Ala Thr Tyr Leu  
   225                 230                 235                 240

Ala Thr Asp Gln Ala Met Arg Asp Gln Lys Tyr Asp Ile Arg Glu Gly  
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Lys Lys Pro Gly Ala Phe Gly Asn Ile Glu Arg Phe Ile Tyr Leu Lys

[illegible]

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<212> PRT
<213> BK virus
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1 5 10 15

Lys Pro Lys Glu Pro Val Gln Val Pro Lys Leu Leu Ile Lys Gly Gly  
20 25 30

Val Glu Val Leu Glu Val Lys Thr Gly Val Asp Ala Ile Thr Glu Val  
35 40 45

Glu Cys Phe Leu Asn Pro Glu Met Gly Asp Pro Asp Asp Asn Leu Arg  
50 55 60

Gly Tyr Ser Gln His Leu Ser Ala Glu Asn Ala Phe Glu Ser Asp Ser  
65 70 75 80

Pro Asp Arg Lys Met Leu Pro Cys Tyr Ser Thr Ala Arg Ile Pro Leu  
85 90 95

Pro Asn Leu Asn Glu Asp Leu Thr Cys Gly Asn Leu Leu Met Trp Glu  
100 105 110

Ala Val Thr Val Lys Thr Glu Val Ile Gly Ile Thr Ser Met Leu Asn  
115 120 125

Leu His Ala Gly Ser Gln Lys Val His Glu Asn Gly Gly Gly Lys Pro  
130 135 140

Val Gln Gly Ser Asn Phe His Phe Phe Ala Val Gly Gly Asp Pro Leu  
 145 150 155 160

Glu Met Gln Gly Val Leu Met Asn Tyr Arg Thr Lys Tyr Pro Gln Gly  
 165 170 175

Thr Ile Thr Pro Lys Asn Pro Thr Ala Gln Ser Gln Val Met Asn Thr  
 180 185 190

Asp His Lys Ala Tyr Leu Asp Lys Asn Asn Ala Tyr Pro Val Glu Cys  
 195 200 205

Trp Ile Pro Asp Pro Ser Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr  
 210 215 220

Tyr Thr Gly Gly Glu Asn Val Pro Pro Val Leu His Val Thr Asn Thr  
 225 230 235 240

Ala Thr Thr Val Leu Leu Asp Glu Gln Gly Val Gly Pro Leu Cys Lys  
 245 250 255

Ala Asp Ser Leu Tyr Val Ser Ala Ala Asp Ile Cys Gly Leu Phe Thr  
 260 265 270

Asn Ser Ser Gly Thr Gln Gln Trp Arg Gly Leu Ala Arg Tyr Phe Lys  
 275 280 285

Ile Arg Leu Arg Lys Arg Ser Val Lys Asn Pro Tyr Pro Ile Ser Phe  
 290 295 300

Leu Leu Ser Asp Leu Ile Asn Arg Arg Thr Gln Lys Val Asp Gly Gln  
 305 310 315 320

Pro Met Tyr Gly Met Glu Ser Gln Val Glu Glu Val Arg Val Phe Asp  
 325 330 335

Gly Thr Glu Gln Leu Pro Gly Asp Pro Asp Met Ile Arg Tyr Ile Asp  
 340 345 350

Arg Gln Gly Gln Leu Gln Thr Lys Met Val  
 355 360

<210> 13  
 <211> 130  
 <212> PRT  
 <213> Bacteriophage fr

&lt;400&gt; 13

Met Ala Ser Asn Phe Glu Glu Phe Val Leu Val Asp Asn Gly Gly Thr  
 1 5 10 15

Gly Asp Val Lys Val Ala Pro Ser Asn Phe Ala Asn Gly Val Ala Glu  
 20 25 30

Trp Ile Ser Ser Asn Ser Arg Ser Gln Ala Tyr Lys Val Thr Cys Ser  
 35 40 45

Val Arg Gln Ser Ser Ala Asn Asn Arg Lys Tyr Thr Val Lys Val Glu  
 50 55 60

Val Pro Lys Val Ala Thr Gln Val Gln Gly Gly Val Glu Leu Pro Val  
 65 70 75 80

Ala Ala Trp Arg Ser Tyr Met Asn Met Glu Leu Thr Ile Pro Val Phe  
 85 90 95

Ala Thr Asn Asp Asp Cys Ala Leu Ile Val Lys Ala Leu Gln Gly Thr  
 100 105 110

Phe Lys Thr Gly Asn Pro Ile Ala Thr Ala Ile Ala Ala Asn Ser Gly  
 115 120 125

Ile Tyr  
 130

&lt;210&gt; 14

&lt;211&gt; 130

&lt;212&gt; PRT

&lt;213&gt; Bacteriophage GA

&lt;400&gt; 14

Met Ala Thr Leu Arg Ser Phe Val Leu Val Asp Asn Gly Gly Thr Gly  
 1 5 10 15

Asn Val Thr Val Val Pro Val Ser Asn Ala Asn Gly Val Ala Glu Trp  
 20 25 30

Leu Ser Asn Asn Ser Arg Ser Gln Ala Tyr Arg Val Thr Ala Ser Tyr  
 35 40 45

Arg Ala Ser Gly Ala Asp Lys Arg Lys Tyr Ala Ile Lys Leu Glu Val  
 50 55 60

Pro Lys Ile Val Thr Gln Val Val Asn Gly Val Glu Leu Pro Gly Ser  
65 70 75 80

Ala Trp Lys Ala Tyr Ala Ser Ile Asp Leu Thr Ile Pro Ile Phe Ala  
85 90 95

Ala Thr Asp Asp Val Thr Val Ile Ser Lys Ser Leu Ala Gly Leu Phe  
100 105 110

Lys Val Gly Asn Pro Ile Ala Glu Ala Ile Ser Ser Gln Ser Gly Phe  
115 120 125

Tyr Ala  
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<210> 15  
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<220>  
<223> HBcAg containing p33 from LCMV

<220>  
<221> CDS  
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Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu  
1 5 10 15

tcg ttt ttg cct tct gac ttc ttt cct tcc gtc aga gat ctc cta gac 96  
Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp  
20 25 30

acc gcc tca gct ctg tat cga gaa gcc tta gag tct cct gag cat tgc 144  
Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys  
35 40 45

tca cct cac cat act gca ctc agg caa gcc att ctc tgc tgg ggg gaa 192  
Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu  
50 55 60

ttg atg act cta gct acc tgg gtg ggt aat aat ttg gaa gat cca gca 240  
Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala  
65 70 75 80

tcc agg gat cta gta gtc aat tat gtt aat act aac atg ggt tta aag 288  
Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys  
85 90 95

atc agg caa cta ttg tgg ttt cat ata tct tgc ctt act ttt gga aga 336  
Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg



100	105	110	
gag act gta ctt gaa tat ttg gtc tct ttc gga gtg tgg att cgc act			384
Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr			
115	120	125	
cct cca gcc tat aga cca cca aat gcc cct atc tta tca aca ctt ccg			432
Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro			
130	135	140	
gaa act act gtt gtt aga cga cgg gac cga ggc agg tcc cct aga aga			480
Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg			
145	150	155	160
aga act ccc tcg cct cgc aga cgc aga tct caa tcg ccg cgt cgc aga			528
Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg			
165	170	175	
aga tct caa tct cgg gaa tct caa tgt ctt ctc ctt aaa gct gtt tac			576
Arg Ser Gln Ser Arg Glu Ser Gln Cys Leu Leu Leu Lys Ala Val Tyr			
180	185	190	
aac ttc gct acc atg taa			594
Asn Phe Ala Thr Met			
195			

<210> 16  
 <211> 197  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> HBcAg containing p33 from LCMV

<400> 16

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
50 55 60

Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
65 70 75 80

Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys
85 90 95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg  
                   100                  105                  110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr  
           115                  120                  125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro  
       130                  135                  140

Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg  
  145                  150                  155                  160

Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg  
                   165                  170                  175

Arg Ser Gln Ser Arg Glu Ser Gln Cys Leu Leu Leu Lys Ala Val Tyr  
                   180                  185                  190

Asn Phe Ala Thr Met  
       195

<210> 17  
 <211> 246  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> dsDNA fragment for packaging and stabilization of BKV

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 tacacatcca ttcatcatgg tgtggtggag gttgacgccg ctgtcacccc agaggagcgc 120  
 cacctgtcca agatgcagca gaacggctac gaaaatccaa cctacaagtt ctttgagcag 180  
 atgcagaacg ctagctatcc atacgatgtc cctgattacg cctaacgcga attcgccagc 240  
 acagtg 246

<210> 18  
 <211> 5  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> GGKGG Linker

<400> 18

Gly Gly Lys Gly Gly  
 1 5

<210> 19  
 <211> 128  
 <212> PRT  
 <213> Bacteriophage PP7

<400> 19

Met Ser Lys Thr Ile Val Leu Ser Val Gly Glu Ala Thr Arg Thr Leu  
 1 5 10 15

Thr Glu Ile Gln Ser Thr Ala Asp Arg Gln Ile Phe Glu Glu Lys Val  
 20 25 30

Gly Pro Leu Val Gly Arg Leu Arg Leu Thr Ala Ser Leu Arg Gln Asn  
 35 40 45

Gly Ala Lys Thr Ala Tyr Arg Val Asn Leu Lys Leu Asp Gln Ala Asp  
 50 55 60

Val Val Asp Cys Ser Thr Ser Val Cys Gly Glu Leu Pro Lys Val Arg  
 65 70 75 80

Tyr Thr Gln Val Trp Ser His Asp Val Thr Ile Val Ala Asn Ser Thr  
 85 90 95

Glu Ala Ser Arg Lys Ser Leu Tyr Asp Leu Thr Lys Ser Leu Val Ala  
 100 105 110

Thr Ser Gln Val Glu Asp Leu Val Val Asn Leu Val Pro Leu Gly Arg  
 115 120 125

<210> 20  
 <211> 132  
 <212> PRT  
 <213> Bacteriophage Q-beta

<400> 20

Ala Lys Leu Glu Thr Val Thr Leu Gly Asn Ile Gly Arg Asp Gly Lys  
 1 5 10 15

Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly Val  
 20 25 30

Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val  
 35 40 45

Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys Val  
 50 55 60

Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser Cys  
65 70 75 80

Asp Pro Ser Val Thr Arg Gln Lys Tyr Ala Asp Val Thr Phe Ser Phe  
85 90 95

Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu Leu  
100 105 110

Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln Leu  
115 120 125

Asn Pro Ala Tyr  
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<210> 21  
<211> 132  
<212> PRT  
<213> Bacteriophage Q-beta

<400> 21

Ala Lys Leu Glu Thr Val Thr Leu Gly Lys Ile Gly Lys Asp Gly Lys  
1 5 10 15

Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly Val  
20 25 30

Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val  
35 40 45

Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys Val  
50 55 60

Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser Cys  
65 70 75 80

Asp Pro Ser Val Thr Arg Gln Lys Tyr Ala Asp Val Thr Phe Ser Phe  
85 90 95

Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu Leu  
100 105 110

Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln Leu  
115 120 125

Asn Pro Ala Tyr  
130

<210> 22  
<211> 132  
<212> PRT  
<213> Bacteriophage Q-beta

<400> 22

Ala Arg Leu Glu Thr Val Thr Leu Gly Asn Ile Gly Arg Asp Gly Lys  
1 5 10 15

Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly Val  
20 25 30

Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val  
35 40 45

Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys Val  
50 55 60

Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser Cys  
65 70 75 80

Asp Pro Ser Val Thr Arg Gln Lys Tyr Ala Asp Val Thr Phe Ser Phe  
85 90 95

Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu Leu  
100 105 110

Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln Leu  
115 120 125

Asn Pro Ala Tyr  
130

<210> 23  
<211> 132  
<212> PRT  
<213> Bacteriophage Q-beta

<400> 23

Ala Lys Leu Glu Thr Val Thr Leu Gly Asn Ile Gly Lys Asp Gly Arg  
1 5 10 15

Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly Val  
20 25 30

Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val  
           35                          40                          45

Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys Val  
       50                          55                          60

Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser Cys  
   65                          70                          75                          80

Asp Pro Ser Val Thr Arg Gln Lys Tyr Ala Asp Val Thr Phe Ser Phe  
                           85                          90                          95

Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu Leu  
           100                          105                          110

Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln Leu  
       115                          120                          125

Asn Pro Ala Tyr  
       130

<210> 24  
 <211> 132  
 <212> PRT  
 <213> Bacteriophage Q-beta

<400> 24

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Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly Val  
           20                          25                          30

Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val  
       35                          40                          45

Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys Val  
       50                          55                          60

Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser Cys  
   65                          70                          75                          80

Asp Pro Ser Val Thr Arg Gln Lys Tyr Ala Asp Val Thr Phe Ser Phe  
                           85                          90                          95

Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu Leu

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Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln Leu		
115	120	125
Asn Pro Ala Tyr		
130		
<210> 25		
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<212> PRT		
<213> Hepatitis B virus		
<400> 25		
Met Asp Ile Asp Pro Tyr Glu Phe Gly Ala Thr Val Glu Leu Leu Ser		
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Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr		
20	25	30
Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser		
35	40	45
Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu		
50	55	60
Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala Ser		
65	70	75 80
Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys Ile		
85	90	95
Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu		
100	105	110
Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro		
115	120	125
Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu		
130	135	140
Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg Arg		
145	150	155 160
Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg		
165	170	175

Ser Gln Ser Arg Glu Ser Gln Cys  
180

<210> 26  
<211> 213  
<212> PRT  
<213> Hepatitis B virus

<400> 26

Met Gln Leu Phe His Leu Cys Leu Ile Ile Ser Cys Ser Cys Pro Thr  
1 5 10 15

Val Gln Ala Ser Lys Leu Cys Leu Gly Trp Leu Trp Gly Met Asp Ile  
20 25 30

Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu  
35 40 45

Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser  
50 55 60

Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His  
65 70 75 80

His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Asp Leu Met Asn  
85 90 95

Leu Ala Thr Trp Val Gly Gly Asn Leu Glu Asp Pro Val Ser Arg Asp  
100 105 110

Leu Val Val Gly Tyr Val Asn Thr Thr Val Gly Leu Lys Phe Arg Gln  
115 120 125

Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val  
130 135 140

Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala  
145 150 155 160

Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr  
165 170 175

Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro  
180 185 190

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser



195                                      200                                      205  
 Arg Glu Ser Gln Cys  
 210  
  
 <210> 27  
 <211> 188  
 <212> PRT  
 <213> Hepatitis B virus  
  
 <400> 27  
 Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu  
 1                                      5                                      10                                      15  
  
 Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp  
                                     20                                      25                                      30  
  
 Thr Ala Thr Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys  
                                     35                                      40                                      45  
  
 Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Asp Glu  
                                     50                                      55                                      60  
  
 Leu Thr Lys Leu Ile Ala Trp Met Ser Ser Asn Ile Thr Ser Glu Gln  
 65                                      70                                      75                                      80  
  
 Val Arg Thr Ile Ile Val Asn His Val Asn Asp Thr Trp Gly Leu Lys  
                                     85                                      90                                      95  
  
 Val Arg Gln Ser Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln  
                                     100                                      105                                      110  
  
 His Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr  
                                     115                                      120                                      125  
  
 Pro Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro  
                                     130                                      135                                      140  
  
 Glu His Thr Val Ile Arg Arg Arg Gly Gly Ala Arg Ala Ser Arg Ser  
 145                                      150                                      155                                      160  
  
 Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro  
                                     165                                      170                                      175  
  
 Arg Arg Arg Arg Ser Gln Ser Pro Ser Thr Asn Cys  
                                     180                                      185

<210> 28  
 <211> 185  
 <212> PRT  
 <213> Hepatitis B virus

<400> 28

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu  
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp  
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys  
 35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu  
 50 55 60

Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala  
 65 70 75 80

Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys  
 85 90 95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg  
 100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr  
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro  
 130 135 140

Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg  
 145 150 155 160

Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg  
 165 170 175

Arg Ser Gln Ser Arg Glu Ser Gln Cys  
 180 185

<210> 29  
 <211> 152  
 <212> PRT  
 <213> Hepatitis B virus

&lt;400&gt; 29

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu  
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp  
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Thr Ala Ala Ala Leu Tyr Arg Asp Ala Leu Glu Ser Pro Glu His Cys  
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Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Asp  
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Leu Met Thr Leu Ala Thr Trp Val Gly Thr Asn Leu Glu Asp Gly Gly  
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Lys Gly Gly Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn Val  
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Gly Leu Lys Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr  
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Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp  
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Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser  
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&lt;213&gt; Artificial Sequence

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Leu Arg Gln Arg Val Lys Val Gly Ile Ala Glu Leu Asn Asn Val Ser  
 35 40 45

Gly Gln Tyr Val Ser Val Tyr Lys Arg Pro Ala Pro Lys Pro Glu Gly  
 50 55 60

Cys Ala Asp Ala Cys Val Ile Met Pro Asn Glu Asn Gln Ser Ile Arg  
 65 70 75 80

Thr Val Ile Ser Gly Ser Ala Glu Asn Leu Ala Thr Leu Lys Ala Glu  
 85 90 95

Trp Glu Thr His Lys Arg Asn Val Asp Thr Leu Phe Ala Ser Gly Asn  
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Thr Thr Ala  
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 35 40 45

Gly Gln Tyr Val Ser Val Tyr Lys Arg Pro Ala Pro Lys Pro Glu Gly  
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Cys Ala Asp Ala Cys Val Ile Met Pro Asn Glu Asn Gln Ser Ile Arg  
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Thr Val Ile Ser Gly Ser Ala Glu Asn Leu Ala Thr Leu Lys Ala Glu  
85 90 95

Trp Glu Thr His Lys Arg Asn Val Asp Thr Leu Phe Ala Ser Gly Asn  
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<220>  
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<220>  
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<220>  
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<400> 51

Gly Cys Gly Ser Gly Gly Gly Gly Ser  
 1 5

<210> 52  
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<220>  
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<220>
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<220>
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<400> 52

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<210> 53
<211> 5
<212> PRT
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<220>
<223> Glycine serine linker

<400> 53

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<210> 54
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Pro

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 <213> Artificial Sequence

<220>  
 <223> N-terminal glycine linker

<400> 58

Gly Cys Gly Gly Gly Gly  
 1 5

<210> 59  
 <211> 6

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> C-terminal glycine linker

<400> 59

Gly Gly Gly Gly Cys Gly  
 1 5

<210> 60  
 <211> 6  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> C-terminal glycine-lysine linker

<400> 60

Gly Gly Lys Lys Gly Cys  
 1 5

<210> 61  
 <211> 6  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> N-terminal glycine-lysine linker

<400> 61

Cys Gly Lys Lys Gly Gly  
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<210> 62  
 <211> 6  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> N-terminal linker 1

<400> 62

Cys Gly Lys Lys Gly Gly  
 1 5

<210> 63  
 <211> 6  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> N-terminal linker 2



<400> 63

Cys Gly Asp Glu Gly Gly  
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<210> 64

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> C-terminal liker

<400> 64

Gly Gly Lys Lys Gly Cys  
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<210> 65

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> C-terminal linker 2

<400> 65

Gly Gly Glu Asp Gly Cys  
1 5

<210> 66

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> C-terminal linker 3

<400> 66

Gly Gly Cys Gly  
1

<210> 67

<211> 9

<212> PRT

<213> Homo sapiens

<400> 67

Lys Ala Val Tyr Asn Phe Ala Thr Met  
1 5

<210> 68

<211> 12  
 <212> PRT  
 <213> Homo sapiens

<400> 68

Cys Gly Gly Lys Ala Val Tyr Asn Phe Ala Thr Met  
 1 5 10

<210> 69  
 <211> 12  
 <212> PRT  
 <213> Homo sapiens

<400> 69

Lys Ala Val Tyr Asn Phe Ala Thr Met Gly Gly Cys  
 1 5 10

<210> 70  
 <211> 18  
 <212> PRT  
 <213> Homo sapiens

<400> 70

Cys Gly Gly Gly Ser Glu Glu Ile Arg Ser Leu Tyr Asn Thr Val Ala  
 1 5 10 15

Thr Leu

<210> 71  
 <211> 50  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> HIV Gag-G50

<400> 71

Cys Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn  
 1 5 10 15

Ala Trp Val Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala  
 20 25 30

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr  
 35 40 45

Val Lys  
 50

<210> 72  
 <211> 56  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> HIV Nef-N56

<400> 72

Cys Gly Val Gly Phe Pro Val Arg Pro Gln Val Pro Leu Arg Pro Met  
 1 5 10 15

Thr Tyr Lys Ala Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly  
 20 25 30

Gly Leu Glu Gly Pro Gly Ile Arg Tyr Pro Leu Thr Phe Gly Trp Cys  
 35 40 45

Phe Lys Leu Val Pro Val Glu Pro  
 50 55

<210> 73  
 <211> 69  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Gag-G68n

<400> 73

Cys Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile  
 1 5 10 15

Val Arg Met Tyr Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg  
 20 25 30

Thr Leu Asn Ala Trp Val Lys Ala Phe Ser Pro Glu Val Ile Pro Met  
 35 40 45

Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met  
 50 55 60

Leu Asn Thr Val Lys  
 65

<210> 74  
 <211> 9  
 <212> PRT  
 <213> Homo sapiens

&lt;400&gt; 74

Leu Pro Tyr Leu Gly Trp Leu Val Phe  
 1 5

&lt;210&gt; 75

&lt;211&gt; 206

&lt;212&gt; PRT

&lt;213&gt; Human immunodeficiency virus

&lt;400&gt; 75

Met Gly Gly Lys Trp Ser Lys Arg Ser Val Val Gly Trp Pro Thr Val  
 1 5 10 15

Arg Glu Arg Met Arg Arg Ala Glu Pro Ala Ala Asp Gly Val Gly Ala  
 20 25 30

Val Ser Arg Asp Leu Glu Lys His Gly Ala Ile Thr Ser Ser Asn Thr  
 35 40 45

Ala Ala Asn Asn Ala Asp Cys Ala Trp Leu Glu Ala Gln Glu Glu Glu  
 50 55 60

Glu Val Gly Phe Pro Val Arg Pro Gln Val Pro Leu Arg Pro Met Thr  
 65 70 75 80

Tyr Lys Ala Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly  
 85 90 95

Leu Glu Gly Leu Ile Tyr Ser Gln Lys Arg Gln Asp Ile Leu Asp Leu  
 100 105 110

Trp Val Tyr His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr  
 115 120 125

Pro Gly Pro Gly Ile Arg Tyr Pro Leu Thr Phe Gly Trp Cys Phe Lys  
 130 135 140

Leu Val Pro Val Glu Pro Glu Lys Val Glu Glu Ala Asn Glu Gly Glu  
 145 150 155 160

Asn Asn Ser Leu Leu His Pro Met Ser Leu His Gly Met Asp Asp Pro  
 165 170 175

Glu Arg Glu Val Leu Val Trp Lys Phe Asp Ser Arg Leu Ala Phe His  
 180 185 190

His Met Ala Arg Glu Leu His Pro Glu Tyr Tyr Lys Asp Cys  
 195 200 205

<210> 76  
 <211> 500  
 <212> PRT  
 <213> Human immunodeficiency virus  
 <400> 76

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp  
 1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys  
 20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro  
 35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu  
 50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn  
 65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp  
 85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys  
 100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val  
 115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His  
 130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu  
 145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser  
 165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly  
 180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195		200		205											
Ala	Ala	Glu	Trp	Asp	Arg	Leu	His	Pro	Val	His	Ala	Gly	Pro	Ile	Ala
210						215					220				
Pro	Gly	Gln	Met	Arg	Glu	Pro	Arg	Gly	Ser	Asp	Ile	Ala	Gly	Thr	Thr
225					230					235					240
Ser	Thr	Leu	Gln	Glu	Gln	Ile	Gly	Trp	Met	Thr	Asn	Asn	Pro	Pro	Ile
			245						250					255	
Pro	Val	Gly	Glu	Ile	Tyr	Lys	Arg	Trp	Ile	Ile	Leu	Gly	Leu	Asn	Lys
			260					265					270		
Ile	Val	Arg	Met	Tyr	Ser	Pro	Thr	Ser	Ile	Leu	Asp	Ile	Arg	Gln	Gly
		275					280					285			
Pro	Lys	Glu	Pro	Phe	Arg	Asp	Tyr	Val	Asp	Arg	Phe	Tyr	Lys	Thr	Leu
	290					295					300				
Arg	Ala	Glu	Gln	Ala	Ser	Gln	Glu	Val	Lys	Asn	Trp	Met	Thr	Glu	Thr
305					310					315					320
Leu	Leu	Val	Gln	Asn	Ala	Asn	Pro	Asp	Cys	Lys	Thr	Ile	Leu	Lys	Ala
			325						330					335	
Leu	Gly	Pro	Ala	Ala	Thr	Leu	Glu	Glu	Met	Met	Thr	Ala	Cys	Gln	Gly
		340						345					350		
Val	Gly	Gly	Pro	Gly	His	Lys	Ala	Arg	Val	Leu	Ala	Glu	Ala	Met	Ser
		355					360					365			
Gln	Val	Thr	Asn	Ser	Ala	Thr	Ile	Met	Met	Gln	Arg	Gly	Asn	Phe	Arg
	370					375					380				
Asn	Gln	Arg	Lys	Thr	Val	Lys	Cys	Phe	Asn	Cys	Gly	Lys	Glu	Gly	His
385					390					395					400
Ile	Ala	Lys	Asn	Cys	Arg	Ala	Pro	Arg	Lys	Lys	Gly	Cys	Trp	Lys	Cys
			405						410					415	
Gly	Lys	Glu	Gly	His	Gln	Met	Lys	Asp	Cys	Thr	Glu	Arg	Gln	Ala	Asn
		420						425					430		
Phe	Leu	Gly	Lys	Ile	Trp	Pro	Ser	His	Lys	Gly	Arg	Pro	Gly	Asn	Phe
	435					440						445			

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg  
 450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp  
 465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp  
 485 490 495

Pro Ser Ser Gln  
 500

<210> 77  
 <211> 34  
 <212> PRT  
 <213> Human immunodeficiency virus

<400> 77

Val Gly Phe Pro Val Arg Pro Gln Val Pro Leu Arg Pro Met Thr Tyr  
 1 5 10 15

Lys Ala Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly Leu  
 20 25 30

Glu Gly

<210> 78  
 <211> 20  
 <212> PRT  
 <213> Human immunodeficiency virus

<400> 78

Pro Gly Ile Arg Tyr Pro Leu Thr Phe Gly Trp Cys Phe Lys Leu Val  
 1 5 10 15

Pro Val Glu Pro  
 20

<210> 79  
 <211> 5  
 <212> PRT  
 <213> Human immunodeficiency virus

<400> 79

Lys Val Val Glu Glu  
 1 5

<210> 80  
 <211> 18  
 <212> PRT  
 <213> Human immunodeficiency virus

<400> 80

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala  
 1 5 10 15

Trp Val

<210> 81  
 <211> 30  
 <212> PRT  
 <213> Human immunodeficiency virus

<400> 81

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu  
 1 5 10 15

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val  
 20 25 30

<210> 82  
 <211> 19  
 <212> PRT  
 <213> Human immunodeficiency virus

<400> 82

Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val  
 1 5 10 15

Arg Met Tyr

<210> 83  
 <211> 54  
 <212> PRT  
 <213> Human immunodeficiency virus

<400> 83

Val Gly Phe Pro Val Arg Pro Gln Val Pro Leu Arg Pro Met Thr Tyr  
 1 5 10 15

Lys Ala Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly Leu  
 20 25 30



Glu Gly Pro Gly Ile Arg Tyr Pro Leu Thr Phe Gly Trp Cys Phe Lys  
                   35                  40                  45

Leu Val Pro Val Glu Pro  
           50

<210> 84  
 <211> 48  
 <212> PRT  
 <213> Human immunodeficiency virus

<400> 84

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala  
 1                  5                  10                  15

Trp Val Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu  
                   20                  25                  30

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val  
           35                  40                  45

<210> 85  
 <211> 49  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> HIV C\_Gag-G50

<400> 85

Cys Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn  
 1                  5                  10                  15

Ala Trp Val Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala  
                   20                  25                  30

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr  
           35                  40                  45

Val

<210> 86  
 <211> 67  
 <212> PRT  
 <213> Human immunodeficiency virus

<400> 86

Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val  
 1 5 10 15

Arg Met Tyr Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr  
 20 25 30

Leu Asn Ala Trp Val Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe  
 35 40 45

Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu  
 50 55 60

Asn Thr Val  
 65

<210> 87  
 <211> 68  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> HIV C\_Gag-G68n

<400> 87

Cys Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile  
 1 5 10 15

Val Arg Met Tyr Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg  
 20 25 30

Thr Leu Asn Ala Trp Val Lys Ala Phe Ser Pro Glu Val Ile Pro Met  
 35 40 45

Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met  
 50 55 60

Leu Asn Thr Val  
 65

<210> 88  
 <211> 64  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer gaglnhefo

<400> 88  
 ggtagctagc tggttgcggt ccgatcgtgc agaacctgca aggtcagatg gttcatcagg 60

cgat 64

<210> 89  
 <211> 60  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer gag2fo

<400> 89  
 aggtcagatg gttcatcagg cgatttctcc gcgtaccctg aacgcatggg tgaaagtggg 60

<210> 90  
 <211> 60  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer gag3fo

<400> 90  
 aacgcatggg tgaaagtggg ggaagagaaa gcgttctctc cggaagttat cccgatgttc 60

<210> 91  
 <211> 60  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer i-gag4ba

<400> 91  
 tgttcagatc ctgcggagta gcaccttcgc tcagtgcgct gaacatcggg ataacttccg 60

<210> 92  
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 <212> DNA  
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<220>  
 <223> Primer i-gag5ba

<400> 92  
 aaccggaatc ggtggattac ccacggtatt cagcatagtg ttcagatcct gcggagtag 59

<210> 93  
 <211> 59  
 <212> DNA  
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<220>  
 <223> Primer gag6fo-b

<400> 93  
 gtaatcctcc gattccgggtt ggcgaaattt acaaacgttg gatcattctg ggtctgaac 59

<210> 94  
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 <212> DNA  
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<220>  
 <223> Primer gag7fo

<400> 94  
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<210> 95  
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 <212> DNA  
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<220>  
 <223> Primer i-gag8ba

<400> 95  
 gaacgggttct ttaggaccct gacggatatc caggatagac gtcggagagt acatg 55

<210> 96  
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 <212> DNA  
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<220>  
 <223> Primer i-gag9-b

<400> 96  
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<210> 97  
 <211> 58  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer i-gag10b-Notba

<400> 97  
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<210> 98  
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<400> 98  
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gcggaacccc	tatttgttta	tttttctaaa	tacattcaaa	tatgtatccg	ctcatgagac	1980
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 cacgcggttg ggaatgtaac tcagctccgc catcgccgct tccacttttt ccgcggtttt 6060  
 cgcagaaacg tggctggcct ggttcaccac gcgggaaacg gtctgataag agacaccggc 6120  
 atactctgcg 6130

<210> 99  
 <211> 393  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> GAGorig sequence

<400> 99  
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 cgatttctcc gcgtaccctg aacgcattggg tgaaagtggg ggaagagaaa gcgttctctc 120  
 cggaagtatt cccgatgttc agcgactga gcgaagggtc tactccgcag gatctgaaca 180  
 ctatgctgaa taccgtgggt aatcctccga ttccggttgg cgaaatttac aaacggttga 240  
 tcattctggg tctgaacaaa atcgtgcgca tgtactctcc gacgtctatc ctggatatcc 300  
 gtcagggtcc taaagaaccg ttccgtgatt acgttgatcg tttctacaaa accctgcgtg 360  
 ctgaacaggc ttcttaatag cggccgcatg agc 393

<210> 100  
 <211> 123  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> GAGorig peptide

<400> 100

Leu Ala Gly Cys Gly Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val  
 1 5 10 15

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val



20					25					30						
Glu	Glu	Lys	Ala	Phe	Ser	Pro	Glu	Val	Ile	Pro	Met	Phe	Ser	Ala	Leu	
35					40					45						
Ser	Glu	Gly	Ala	Thr	Pro	Gln	Asp	Leu	Asn	Thr	Met	Leu	Asn	Thr	Val	
50					55					60						
Gly	Asn	Pro	Pro	Ile	Pro	Val	Gly	Glu	Ile	Tyr	Lys	Arg	Trp	Ile	Ile	
65					70					75					80	
Leu	Gly	Leu	Asn	Lys	Ile	Val	Arg	Met	Tyr	Ser	Pro	Thr	Ser	Ile	Leu	
85					90					95						
Asp	Ile	Arg	Gln	Gly	Pro	Lys	Glu	Pro	Phe	Arg	Asp	Tyr	Val	Asp	Arg	
100					105					110						
Phe	Tyr	Lys	Thr	Leu	Arg	Ala	Glu	Gln	Ala	Ser						
115					120											

<210> 101  
 <211> 270  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> 81GAG sequence

<400> 101	
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atgggtgaaa gcgttctctc cggaagttat cccgatgttc agcgcactga gcgaagggtgc	120
tactccgcag gatctgaaca ctatgctgaa taccgtgggt gaaatttaca aacgttggat	180
cattctgggt ctgaacaaaa tcgtgcgcgt gtaccgtgct gaacaggctt ctcaggaagt	240
gaagaactgg atgtaatagc ggccgcttgg	270

<210> 102  
 <211> 83  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> 81GAG peptide

<400> 102

Leu	Ala	Cys	Gln	Gly	Gln	Met	Val	His	Gln	Ala	Ile	Ser	Pro	Arg	Thr
1				5					10					15	

Leu Asn Ala Trp Val Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe  
                   20                                  25                                  30

Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu  
                   35                                  40                                  45

Asn Thr Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn  
                   50                                  55                                  60

Lys Ile Val Arg Met Tyr Arg Ala Glu Gln Ala Ser Gln Glu Val Lys  
                   65                                  70                                  75                                  80

Asn Trp Met

<210> 103  
 <211> 89  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer 80gag1nhe

<400> 103  
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 atgggtgaaa gcgttctctc cggaagtta 89

<210> 104  
 <211> 24  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer i-80gag2

<400> 104  
 cacggtattc agcatagtgt tcag 24

<210> 105  
 <211> 48  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer 80gag3

<400> 105  
 ctgaacacta tgctgaatac cgtgggtgaa atttacaac gttggatc 48

<210> 106  
 <211> 80  
 <212> DNA

<213> Artificial Sequence

<220>

<223> Primer i-81gag4

<400> 106

ccaagcggcc gctattacat ccagttcttc acttcctgag aagcctgttc agcacggtac 60

atgcgcacga ttttggttcag 80

<210> 107

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer gagC1fo

<400> 107

gtaagctagc atgcggtccg acgtctatcc tggatatcc 39

<210> 108

<211> 58

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer i-gagC2ba

<400> 108

cagcagagtt tcggtcatcc agttttttcac ttcctgagaa gcctgttcag cacgcagg 58

<210> 109

<211> 55

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer Gag3Cfo

<400> 109

aactggatga ccgaaactct gctgggttcag aacgctaacc cggattgcaa gacca 55

<210> 110

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer gagC4fo

<400> 110

acgctaaccg ggattgcaag accatcctga aagcttttagg tccagcagcg 50

<210> 111

<211> 50

<212> DNA  
<213> Artificial Sequence

<220>  
<223> Primer i-gagC5ba

<400> 111  
caagcagtca tcattctcttc gagggtcgct gctggaccta aagctttcag 50

<210> 112  
<211> 50  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Primer i-gag6Cba

<400> 112  
gctcatgagg ccgctattaa ccctggcaag cagtcattcat ctcttcgagg 50

<210> 113  
<211> 258  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> GagC sequence

<400> 113  
gtaagctagc atgcgggtccg acgtctatcc tggatatccg tcaggggcct aaagaaccgt 60  
tccgtgatta cgttgatcgt ttctacaaaa ccctgctgctg tgaacagggt tctcaggaag 120  
tgaaaaactg gatgaccgaa actctgctgg ttcagaacgc taaccgggat tgcaagacca 180  
tcctgaaagc tttaggtcca gcagcgaccc tcgaagagat gatgactgct tgccagggtt 240  
aatagcggcc gcatgagc 258

<210> 114  
<211> 78  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> GagC peptide

<400> 114

Leu Ala Cys Gly Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys  
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Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala  
20 25 30

Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu

35                                      40                                      45  
 Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly  
 50                                      55                                      60  
  
 Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly  
 65                                      70                                      75  
  
 <210> 115  
 <211> 253  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Nef74 sequence  
  
 <400> 115  
 gcaagctagc tggttgcggt gtgggtttcc cggttcgtcc tcaggttcct ctgcgtccga 60  
 tgacttacia agcagctggt gacctgtctc acttcctgaa agaaaagggt ggcctggaat 120  
 gggtttacca cacgcagggc tactttccgg attggcagaa ctacactcca ggtccaggta 180  
 tccgttatcc tctgaccttc ggttggtggt tcaagctggt gccggttgaa ccgtaatagc 240  
 ggccgcataa tgt 253  
  
 <210> 116  
 <211> 76  
 <212> PRT  
 <213> Artificial Sequence  
  
 <220>  
 <223> Nef74 peptide  
  
 <400> 116  
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 Arg Pro Met Thr Tyr Lys Ala Ala Val Asp Leu Ser His Phe Leu Lys  
 20                                      25                                      30  
  
 Glu Lys Gly Gly Leu Glu Trp Val Tyr His Thr Gln Gly Tyr Phe Pro  
 35                                      40                                      45  
  
 Asp Trp Gln Asn Tyr Thr Pro Gly Pro Gly Ile Arg Tyr Pro Leu Thr  
 50                                      55                                      60  
  
 Phe Gly Trp Cys Phe Lys Leu Val Pro Val Glu Pro  
 65                                      70                                      75

<210> 117  
 <211> 47  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer Solnef1

<400> 117  
 aagctagctg gttgcgggtgt gggtttcccg gttcgtcctc aggttcc 47

<210> 118  
 <211> 49  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer i-solnef2

<400> 118  
 caacagctgc tttgtaagtc atcggacgca gaggaacctg aggacgaac 49

<210> 119  
 <211> 47  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer Solnef3

<400> 119  
 acttacaaag cagctgttga cctgtctcac ttcttgaaag aaaaggg 47

<210> 120  
 <211> 48  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer i-solnef4

<400> 120  
 cctgcgtgtg gtaaaccat tccaggccac ccttttcttt caggaagt 48

<210> 121  
 <211> 50  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer Nef-orig1

<400> 121  
 gaatgggttt accacacgca gggctacttt ccggattggc agaactacac 50

<210> 122

<211> 50  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer Nef-orig2

<400> 122  
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<210> 123  
 <211> 50  
 <212> DNA  
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<220>  
 <223> Primer Nef-orig3

<400> 123  
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<210> 124  
 <211> 58  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer i-Nef-orig4

<400> 124  
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<210> 125  
 <211> 59  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer i-Nef-orig5

<400> 125  
 cacgagccat atgatggaat gccagacgag agtcgaactt ccataccagc acttccttc 59

<210> 126  
 <211> 50  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer i-Nef-orig6

<400> 126  
 ccctatgcgg ccgcctatta gtgcagttca cgagccatat gatggaatgc 50

<210> 127  
 <211> 45

<212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer i-74nefNotba

<400> 127  
 gcgtatgcgg ccgctattac gggtcaaccg gcaccagctt gaaac 45

<210> 128  
 <211> 320  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> NEForig sequence

<400> 128  
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 gtttaccaca cgcagggcta ctttccggat tggcagaact acactccagg tccaggtatc 180  
 cggtatcctc tgaccttcgg ttggtgtttc aagctgggtc cggttgaacc ggagaaggaa 240  
 gtgctggtat ggaagtccga ctctcgtctg gcattccatc atatggctcg tgaactgcac 300  
 taataggcgg ccgcataggg 320